

Introduction

This issue of *Molecular Neurobiology* is our forum for the proceedings of the Satellite of the 14th ISN Meeting and the First International Workshop on development and differentiation of the nervous system, entitled "The Neuronal Phenotype, Molecular Genetics, Cell Specification, Plasticity, and Therapeutic Frontiers," which was held in Lozari in Corsica, France in August of 1993.

The meeting focused on one of the most formidable problems in developmental neurobiology, that is, the mechanisms by which the estimated 10^{12} neurons in the nervous system acquire their specific cellular identities or their phenotypes. The multiple forms of cellular identities and the resultant phenotypic diversity of the adult nervous system are essential prerequisites for normal functions of the nervous system, as is sadly illustrated by the deficits manifested in various forms of neuropsychiatric disorders. Our current knowledge of this fascinating and highly complex field is spotty at best and very many pieces of the puzzle remain missing or simply incorrectly placed.

The meeting was designed to bring together scientists using approaches as diverse as fly genetics and gene therapy, but focusing on the theme problem. The very form of the meeting seemed particularly appropriate, because the synergism between the different approaches is now more apparent than most had ever envisioned. This impressive array of approaches also illustrates an important point in today's neurobiology—that the puzzle of developmental control is clearly being solved more quickly

by extremely diverse approaches, and that only in combination can these approaches answer some of the most fundamental questions. All these reasons make the field of neurobiology truly fascinating, and by the same token extremely challenging. An illustration of the unpredictable interconnections between various approaches that are converging, and thus enhancing our knowledge, is that no one imagined that signal transduction pathways involving protein kinases, which in many cases were themselves discovered in mammalian systems, could be dissected in such exquisite detail for lower organisms, such as *Drosophila*.

The content of the meeting is highlighted in this volume by many of the participating scientists. The majority of the articles are primarily tutorial in nature, and show the broad contributions of a particular approach to the understanding of neurogenesis, or to various aspects of the regulation of the neuronal phenotype, whereas others address a specific issue in detail. This special issue itself is divided into two parts. Part I covers several aspects of the extracellular signalling, and discusses the genetics of neurogenesis, the involvement of various types of molecules that have been found to control certain aspects of differentiation or maintenance of the phenotype, hormones and trophic factors, and intracellular messengers. In Part II, various levels of gene regulation are illustrated from transcriptional control through antisense oligonucleotides. This last example also illustrates our original goal to explore potential future therapeutic applications of novel findings and technologies.

We hope that just as the Workshop turned out to fulfill our intentions of being a true "brainstorming," this volume of *Molecular Neurobiol-*

ogy will also serve its purpose by bringing these important messages and knowledge to a wider but, one hopes, equally enthusiastic audience.

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